



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,866	10/23/2003	Paul A. Ward	CSLL-639CN (56247- )	6735
7590 09/06/2005 McDermott, Will & Emery 28 State Street Boston, MA 02109-1775			EXAMINER CORRIELUS, JEAN B	
			ART UNIT 2637	PAPER NUMBER
DATE MAILED: 09/06/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/691,866	WARD ET AL.	
	Examiner	Art Unit	
	Jean B Corrielus	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 July 2005.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 24-26,36,37,41 and 42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 24-26,36,37,41 and 42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>5/26/05</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### **Response to Arguments**

1. Applicant's arguments, see response filed, 7/21/05, page 9-10 with respect to 112 first paragraph rejection have been fully considered and are persuasive. The 112 rejection has been withdrawn.

Applicant's arguments filed on 1/21/05 with respect to claims 24-26, 36, 37, 41 and 42 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Objections***

2. Claim 24, line 3, "output" should be deleted so as to be consistent with antecedent in line 2.

Appropriate correction is required.

3. The drawings were received on 7/21/05. These drawings are acceptable.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 24-26, 36, 37, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birgenheier et al US Patent No. 5,187,719 in view of Hori et al US Patent No. 4,435,751 and further in view of applicant's disclosure page 12, lines 9-17.

As per claim 24, Birgenheier et al teaches figs. 2-3 a digitizer 19 (analog to digital) converter which receives an analog signal and converts the analog signal to a digital signal to form an inphase component I of said signal; a  $-90$  degrees (Hilbert) transformer approximation device see col. 6, line 56 which receives said digital signal and produces the quadrature component of said digital signal by introducing a phase shift to said digital signal see col. 7, lines 1-3; an amplitude computation device 66 which receives said I and Q components and computes the instantaneous amplitude of said digital signal according to  $a = \text{SQRT}(Q^2 + I^2)$  and see fig. 3; device 66 further includes a phase computation device which receives said I and Q components and computes the instantaneous phase of said digital signal according to  $\theta = \text{ARCTAN}(Q/I)^{-1}$ . Note that the input signal of Birgenheier is inherently a sinusoidal signal. However, Birgenheier does not explicitly teach a vibratory sensor for producing said analog signal in response to a measurement parameter. It further fails to teach a CORDIC processor is used to compute the phase and amplitude signal. Hori et al teaches an apparatus comprising a vibratory sensor 12 for producing an analog signal in response to a measurement parameter (vibration) of an apparatus (object) 10 and provides the analog signal to an A/D converter 16. Given that fact, it would have been obvious to one skill in the art to incorporate such a teaching in Birgenheier et al in order provide proper signal input source to the analog to digital converter so that proper measurement of the phase and amplitude of such a signal can be computed. Furthermore, at page 12, lines 9-17, applicant acknowledges that a CORDIC processor is a well known device used in signal processing for fast digital trigonometric computations. Given that it would have been

Art Unit: 2637

obvious to one skill in the art to incorporate such a teaching in Birgenheier and Hori and order to perform fast digital trigonometric computations.

As per claim 25 the Hilbert transformer introduces a predetermined delay into said quadrature component see col. 7, lines 1-3.

As per claim 26, the system further includes a delay device 33 which introduces said predetermined delay into said I component.

As per claim 36, see claim 24. In addition, Birgenheier teaches a filter 123 to attenuate out of band noise in said signal and a further includes a delay device 33 which introduces said predetermined delay into said I component.

As per claim 37, it would have been obvious to one skill in the art to provide a microphone as a signal input source to Birgenheier and the reason to do so would have been the same as provided above in reference to claim 24.

As per claim 41, see claim 24. In addition, note that the analog signal generated by Hori is characterized by a phase and an amplitude of said parameter see col. 2, lines 24-42. Hence, it would have been obvious to provide such a signal as an input to the digitizer of Birgenheier and the reason to do so would have been the same as provided above in reference to claim 24.


As per claim 42, see claim 24. In addition, Birgenheier teaches a filter 123 to attenuate out of band noise in said signal and a further includes a delay device 33 which introduces said predetermined delay into said I component. Note that the analog signal generated by Hori is characterized by a phase and an amplitude of said parameter see col. 2, lines 24-42. Hence, it would have been obvious to provide such a signal as an

input to the digitizer of Birgenheier and the reason to do so would have been the same as provided above in reference to claim 24.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B Corrielus whose telephone number is 571-272-3020. The examiner can normally be reached on Maxi-Flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-3086. The fax phone number for the organization where this application or proceeding is assigned is 571-272-3020.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jean B Corrielus  
Primary Examiner  
Art Unit 2637  
9/3/05